

supplies the easterly rim of the sinking area, while on the N. E. a submarine ridge connects New Zealand with Australia, and supplies another segment of the margin. The floor of this scallop-shaped depression is 15,000 feet below the sea-level, and the focus of the last earthquake shocks is located beneath an ocean 12,000 feet deep. Here then we have the area of subsidence which this hypothesis requires.

If the recent shocks have been due to such conditions as these, it would be likely that ruptures would occur almost simultaneously at the depressed centre, and around the mountain margin. If such has been the case it would account for the apparently very high rates of speed, and explain many discrepancies in the time-record, such as the synchronous shocks at Wilson's Promontory and Beechworth, places on different seismic circles.

I have stated that there are two other conditions under which the earth's crust can be ruptured, and the surface shaken. Both of these operations are superficial and local in their effects, and both are connected with volcanic action. The time at my disposal will not suffice to discuss their applicability to the present case, and I will not stop to describe them, as I consider that the conclusion best justified by the phenomena recorded, is that the shocks are due to secular shrinkage of the earth, this giving rise to the fracture and distortion of the region about and below us, with a depression of the sea-bed to the east of Tasmania, and a slow elevation of the S. E. of Australia, and perhaps the west coast of New Zealand.

ART. IV.—*The Atmosphere a Source of Nitrogen in
Plant Economy.*

BY E. LLOYD MARKS.

[Read 11th June, 1885.]